



Oliver Manahan, Chip Solutions



MasterCard
Worldwide



What's Up With EMV?



Agenda

INTRODUCTION TO CHIP

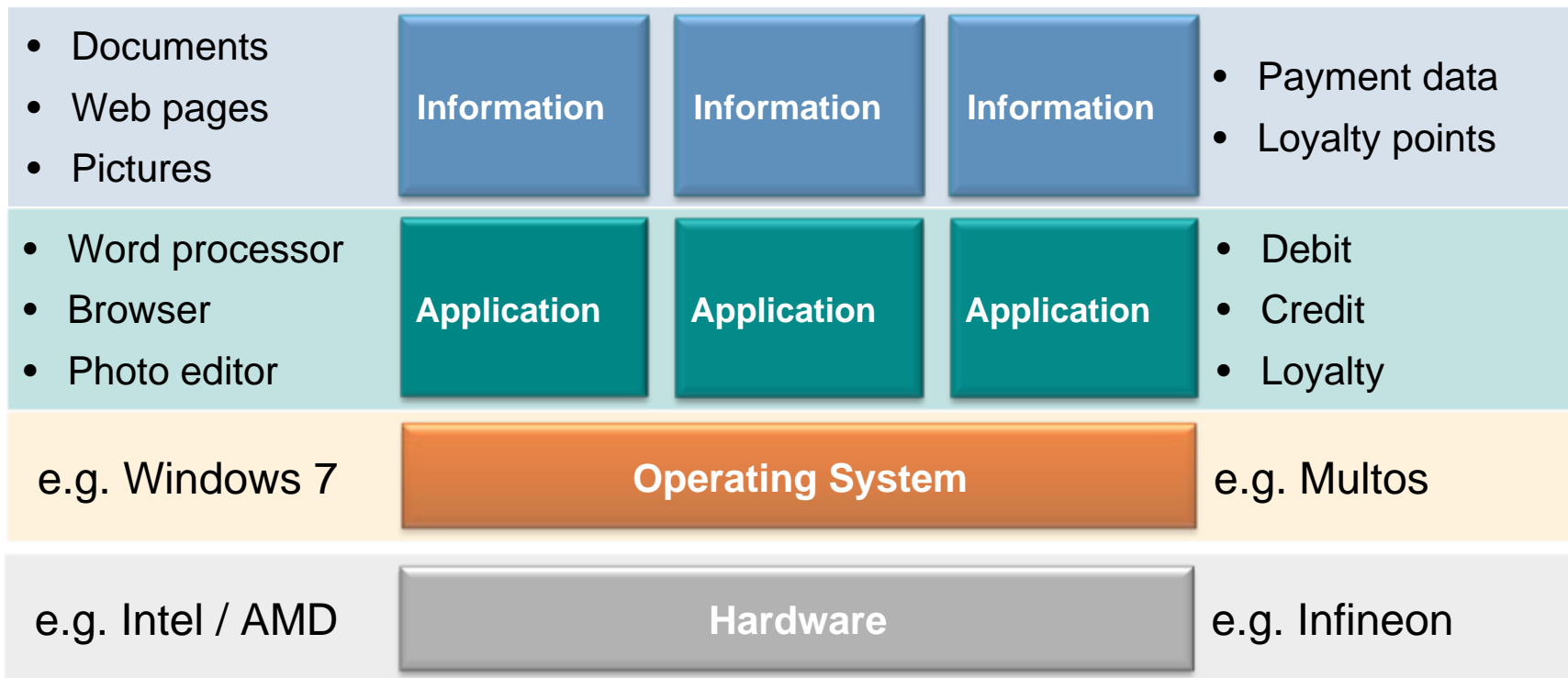
- How does it work? What does it do?
- Global Deployment

CHIP SOLUTIONS

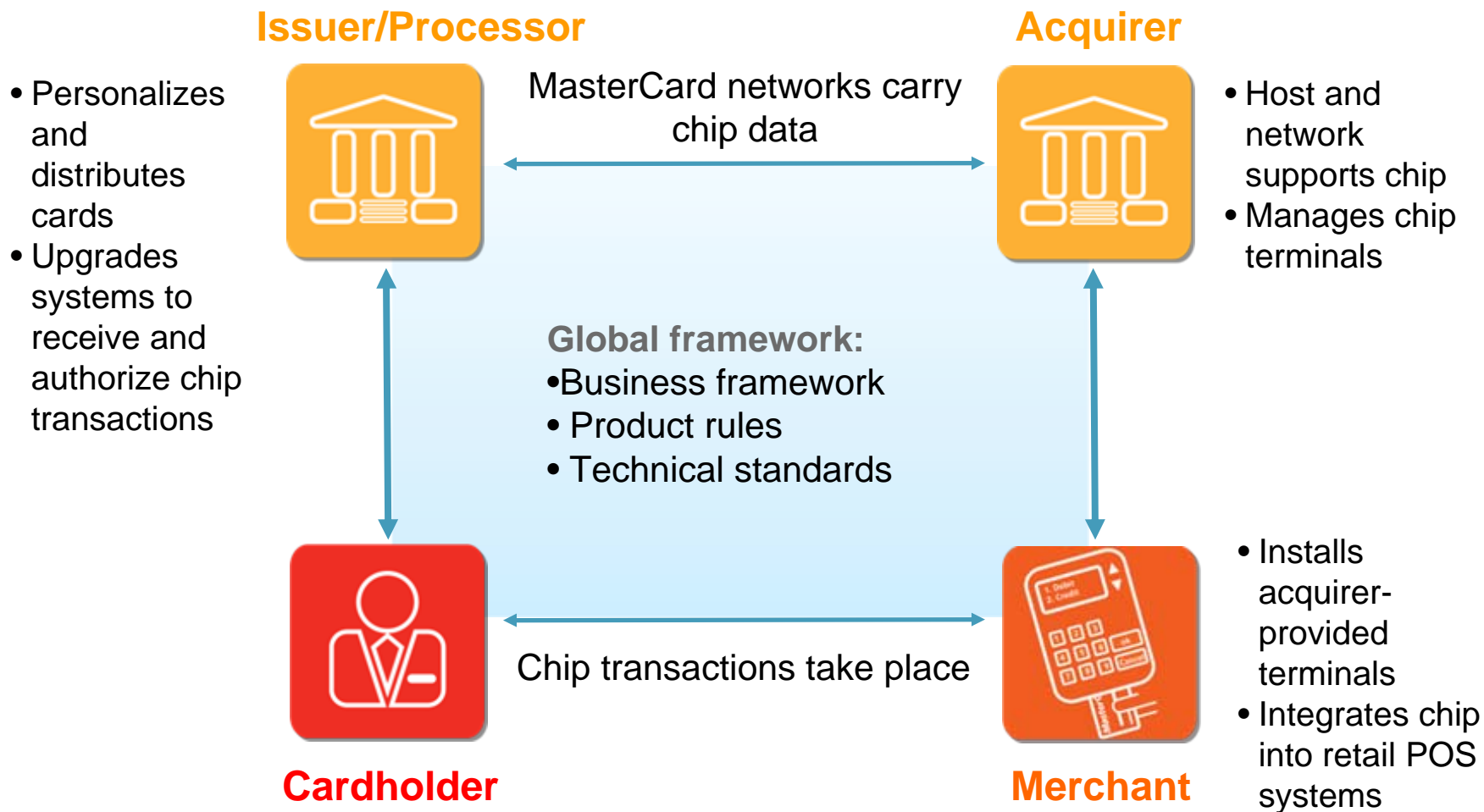
- M/Chip – The foundation for chip payments
- A Chip Transaction
- PIN



Chip cards are miniature computer systems



Chip-enabled global payments infrastructure



Why chip?

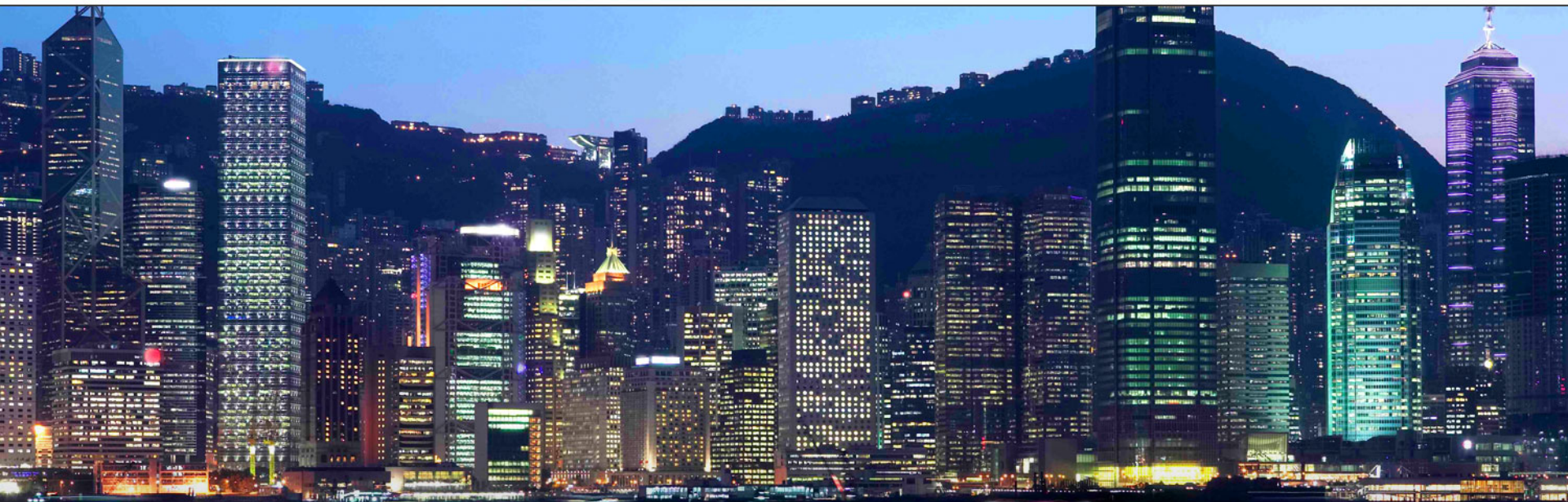
Chip cards

- ▶ are instrumental in reducing fraud
- ▶ enable new MasterCard products and solutions



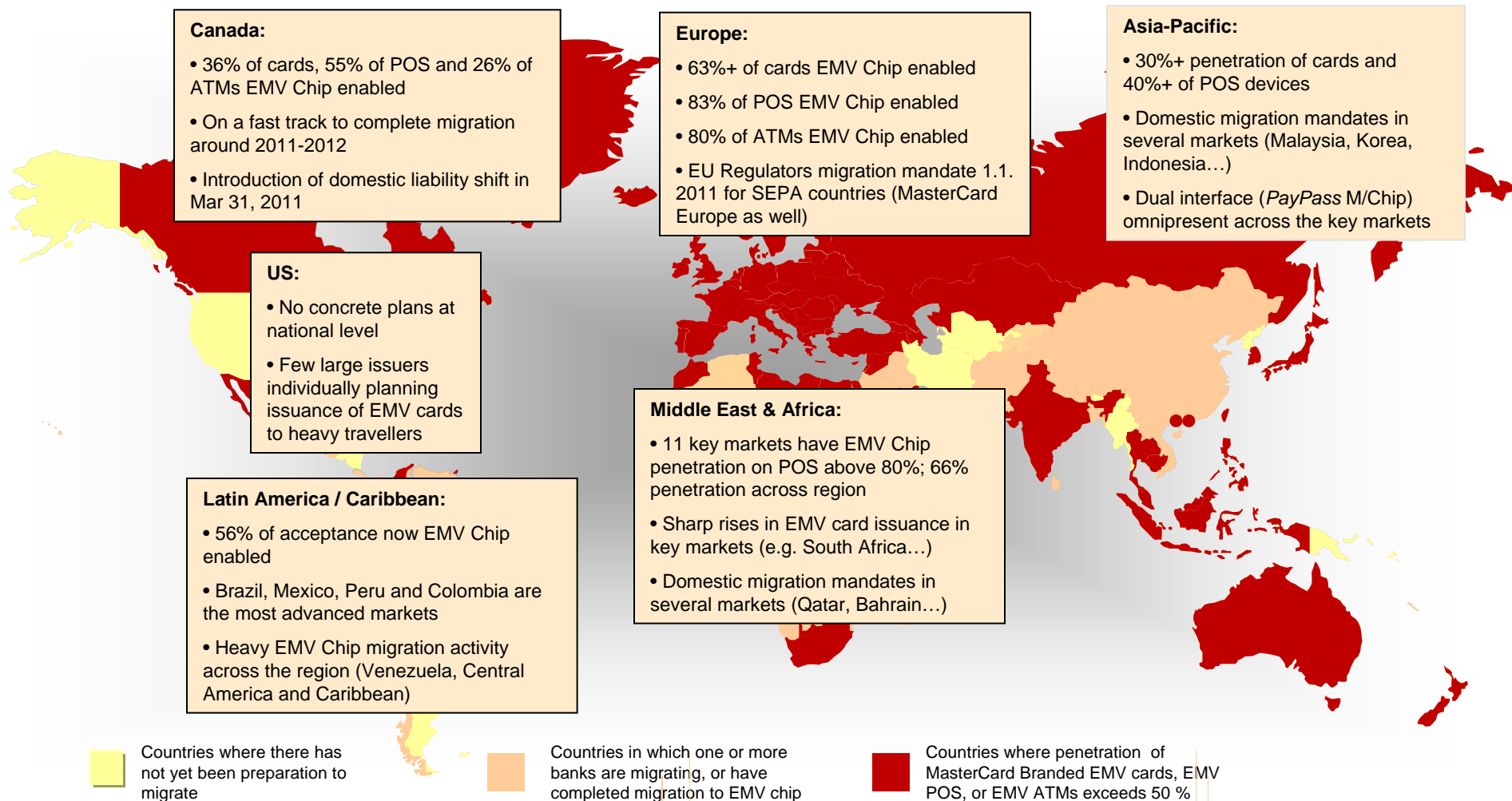


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Global Deployment

Delivering on the Promise of Chip, Worldwide

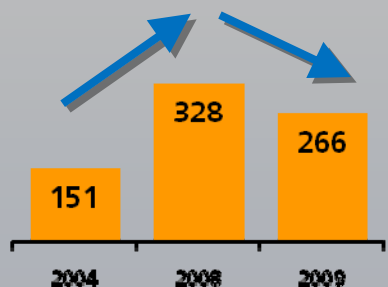
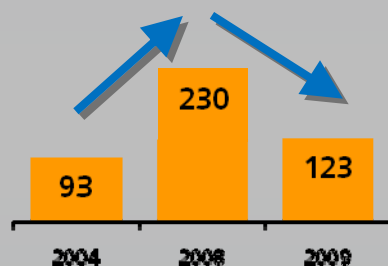
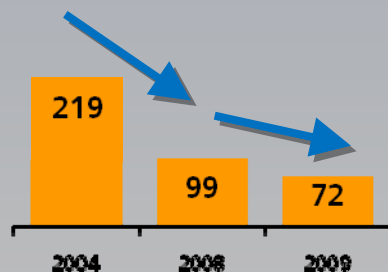


Safer payments - it's beginning to work!

UK fraud figures for 2004-2008 and 2008-2009



UK fraud losses in £millions



- UK retailer face-to-face fraud steadily down since Chip & PIN deployed
- Cross-border fraud first up (UK card data used in non-chip countries) but now going down
- Card-not-present fraud first up (migration from face-to-face) but now going down

Source: APACS – "Fraud, the facts", 2009 & March 10, 2010 Press Release



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Chip Solutions

Chip - a foundation for innovative solutions



Cardholder / Merchant Experience



Service code = 2xx

“2” = Chip; prompt:

“Please insert the chip card”

Card remains in the
device for the duration
of the transaction

Offline vs. Online PIN - Explained

Online PIN is in the Issuer's Host  Issuer Host

Offline PIN is in the Chip 



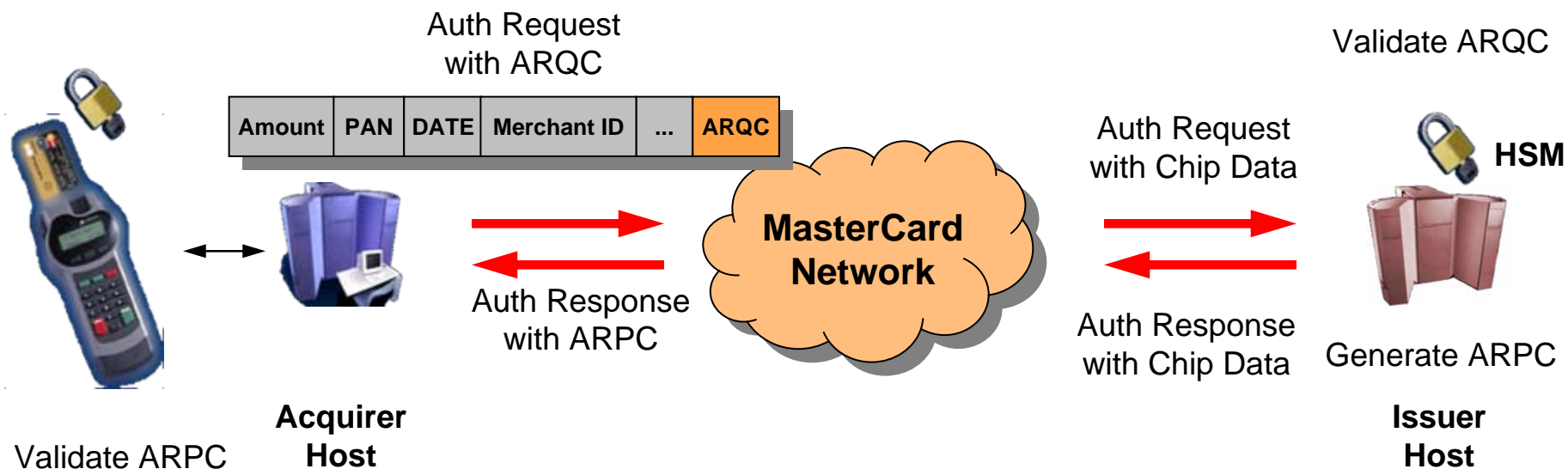
- Issuers will typically want to offer Self Selection of PIN to cardholders and will need to support a secure process for PIN change and PIN unblock (in the case of forgotten PINs)
- When either the online or offline PIN is changed, they must be synchronized
- ABMs are generally used for PIN management
- For this purpose, ABMs would need to be chip-enabled

Is the Card Genuine?

Chip can check card authenticity offline and online:

- **Offline Card Authentication Method (CAM)**
 - ¶ **SDA** - Static Data Authentication (token is always the same)
 - ¶ **DDA** - Dynamic Data Authentication (token changes with each transaction)
 - ¶ **CDA** - Combined Data Authentication (transaction data used to generate token)
- **Online Card Authentication Method (CAM)**
 - ¶ **Authorization ReQuest Cryptogram (ARQC)**
 - ¶ Validated at the issuer host

Online Card Authentication Method



Chip Myth # 1

- Offline PIN = Offline Transaction
- Most Chip transactions are still sent online to the issuer
- The PIN is verified by the card, and the results of that verification are sent in the auth message
- ATM / Cash Withdrawal transactions still use online PIN (these transactions are always online)
- Therefore, **Offline PIN \neq Offline Transaction**
- Similarly, **Offline CAM \neq Offline Transaction**

Chip Myth # 2

- PIN = Single Message
- Because the PIN is verified by the Chip, “traditional” processing can take place
- In most markets, the magnetic stripe model – single message versus dual message – carried on the chip model
- Therefore, **PIN ≠ Single Message**

Chip to Magnetic Stripe Conversion

Functional Overview



Acquirer
Host

Auth Request
with ARQC



Auth Response
without ARPC



Chip Data



Must accept new values in DE48 SE71

Magnetic
stripe request



Response

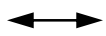


Issuer
Host

* Also available for Clearing

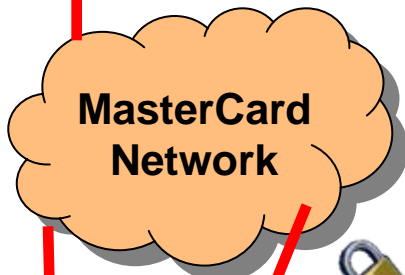
Combined Service Option

Functional Overview



Acquirer Host

Auth Request with ARQC
 Auth Response with ARPC



Must accept new values in DE48 SE71, 72, 79

Validate ARQC

Magstripe request with ARQC result

Response



Issuer Host

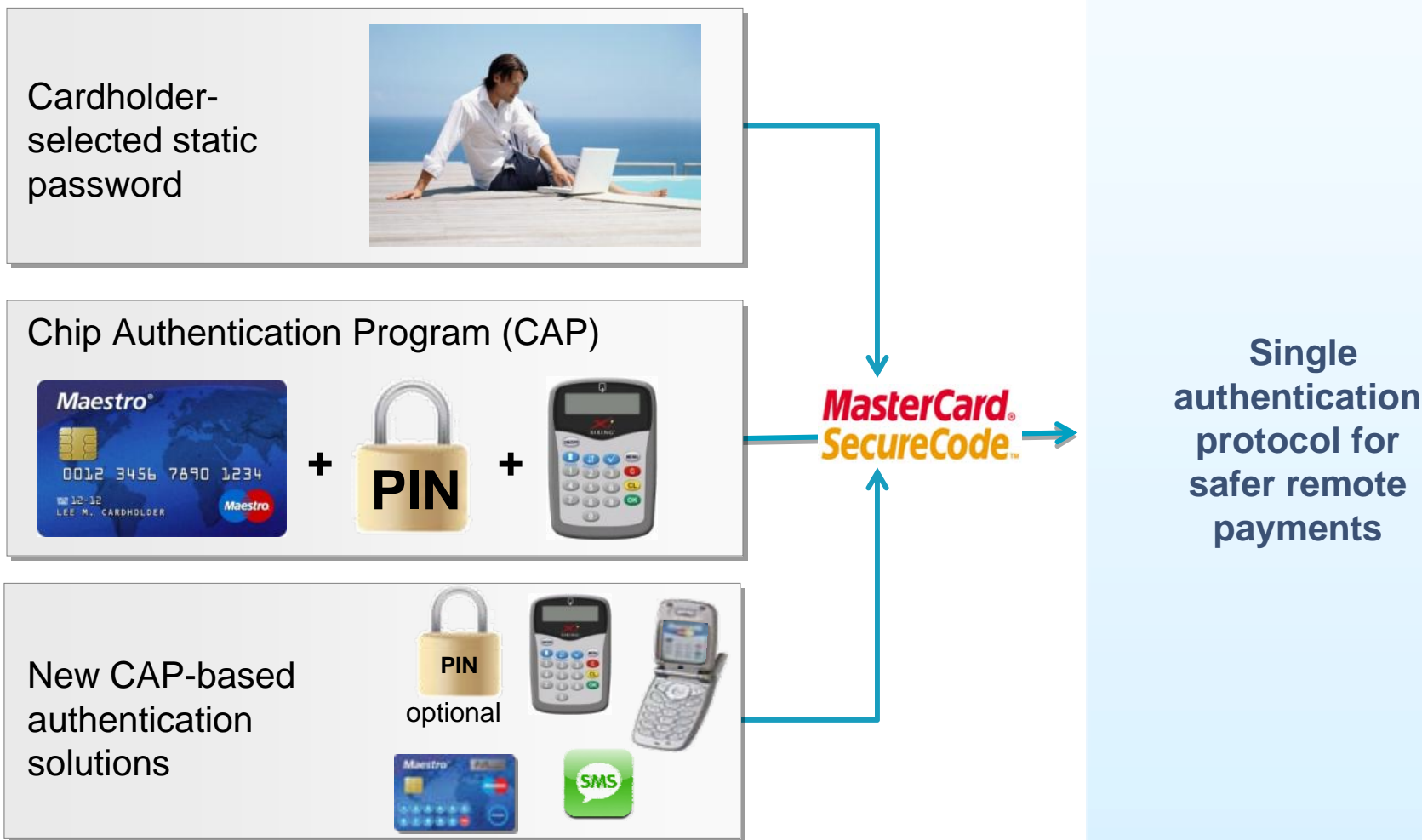
Chip Data



Generate ARPC



Chip Authentication – enabling e-commerce and remote payments



Display Cards

The next generation payment card

- Standard form factor with a display
 - ¶ Stripe, contact & contactless
 - ¶ Un-embossed or embossed
- One or several buttons for user interaction
- Battery powered, e-ink display and buttons
- Two chips – EMV & ‘display driver’
- Card form approved by MasterCard
- Product propositions :
 - ¶ Advanced Authentication
 - ¶ Balance Display
 - ¶ Account Selection (TBC)





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APPENDIX

